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10/089,802	04/04/2002	Toru Kawase	OGOH:110	3089

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Parkhurst & Wendel
1421 Prince Street Suite 210
Alexandria, VA 22314-2805

EXAMINER	
NGUYEN, KEVIN M	

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2674	7

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/089,802	Applicant(s) KAWASE ET AL.	
	Examiner Kevin M. Nguyen	Art Unit 2674	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 April 2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-70* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-70* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *04/04/02*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claims 1-22, 34-55, 68-70 are rejected under 35 U.S.C. 102(e) as being anticipated by Yamaguchi et al (US 6,621,475).

2. As to claim 1, 34, Yamaguchi et al teaches a display panel associated with a method of correcting luminance, the display panel comprising

As shown in Fig. 1A, consecutive rectangular voltage pulses were used as a driving signal, and the application period of the voltage pulses was divided into three periods (col. 8, lines 37-40). The correction method has several steps, and a voltage to be added to each device in each step is set as follows. Particularly, VLmeasure, a driving voltage for measuring the luminance of each phosphor in a measuring step, Vshift, a characteristics shift voltage for adjusting the luminance of each phosphor to become uniform in an adjusting step, Vdrive, a maximum voltage for driving the devices to display an image. Those voltages have a relation as shown below.

$$Vdrive < VLmeasure < Vshift$$

As shown above, since VLmeasure is higher than Vdrive, a higher voltage is added to each surface conduction emission device in advance, than a driving voltage of displaying an image. Therefore, the characteristics of each device are kept from being changed by being added a higher voltage in an actual usage. Further, since Vshift is set to be more higher than VLmeasure, the shift characteristics voltage Vshift is a maximum voltage to be added to each surface conduction emission device. Accordingly, the electron emission characteristics of each device can be corrected to a desired value by adding the Vshift. Furthermore, since Vshift is set to be higher than Vdrive, the characteristics of each device do not change in the actual usage after the luminance of each phosphor has been adjusted to be uniform (col. 15, line 67 to col. 17, line 23).

Thus, the teaching of Yamaguchi et al meets the claimed limitations.

As to claims 2, 35, Yamaguchi et al teaches aiming at the characteristic of a device whose characteristic curve is located furthest to the right as a target (reference), thereby matching with the target (col. 13, lines 26-29).

As to claims 9, 42, Yamaguchi teaches the peak value for measurement is higher than a driving voltage Vf for displaying an image (col. 12, lines 32-33).

As to claims 16, 49, Yamaguchi teaches in order to equalize the electron-emitting characteristic of a plurality of electron emission devices, an electrical characteristic curve (Vf-Ie) of one device is shifted towards the right in the graph (FIG. 2A), aiming at the characteristic of a device whose characteristic curve is located furthest to the right as a target (reference), thereby matching with the target (col. 13, lines 23-29).

As to claims 4, 37, Yamaguchi teaches Vdrive<VEmeasure<Vshift (col. 11, lines 3-12).

3. As to claim 3, 36, Yamaguchi et al teaches a display panel associated with a method of correcting luminance, the display panel comprising

As shown in Fig. 1A, consecutive rectangular voltage pulses were used as a driving signal, and the application period of the voltage pulses was divided into three periods (col. 8, lines 37-40). The correction method has several steps, and a voltage to be added to each device in each step is set as follows. Particularly, VLmeasure, a driving voltage for measuring the luminance of each phosphor in a measuring step, Vshift, a characteristics shift voltage for adjusting the luminance of each phosphor to become uniform in an adjusting step, Vdrive, a maximum voltage for driving the devices to display an image. Those voltages have a relation as shown below.

Vdrive < VLmeasure < Vshift

As shown above, since VLmeasure is higher than Vdrive, a higher voltage is added to each surface conduction emission device in advance, than a driving voltage of displaying an image. Therefore, the characteristics of each device are kept from being changed by being added a higher voltage in an actual usage. Further, since Vshift is set to be more higher than VLmeasure, the shift characteristics voltage Vshift is a maximum voltage to be added to each surface conduction emission device. Accordingly, the electron emission characteristics of each device can be corrected to a desired value by adding the Vshift. Furthermore, since Vshift is set to be higher than Vdrive, the characteristics of each device do not change in the actual usage after the

luminance of each phosphor has been adjusted to be uniform (col. 15, line 67 to col. 17, line 23).

As to claims 10, Yamaguchi teaches the peak value for measurement is higher than a driving voltage Vf for displaying an image (col. 12, lines 32-33).

As to claim 11, Yamaguchi teaches measurement conditions were: pulse width Ta and T2 in each period (fig. 1A, col. 8, lines 43-44). Thus, periods between the pulse width Vf are blanking period.

As to claim 12, Yamaguchi teaches driving signal source to each surface-conduction emission device was sufficiently reduced (col. 8, lines 50-51).

As to claims 13-15, 46-48, Yamaguchi teaches both variations in luminance including a partial variation in light emission characteristics of the phosphor is corrected (col. 17, lines 57-58).

As to claims 17, 50, Yamaguchi teaches the captured luminance information (a current detector 12, fig. 3) is driving current (Ie) (fig. 3).

As to claims 18, 51, Yamaguchi teaches the starting point of the pixels (fig. 1A).

As to claims 19, 52, Yamaguchi teaches the display panel 1, an anode electrode 1114 (fig. 18D), a surface 1114 (fig. 18D), a phosphor (fig. 16B), an anode current 1116 (fig. 18D).

As to claims 21, 22, 54, 55, Yamaguchi teaches the determined voltage value is stored in the memory 9b (col. 12, lines 51-52).

4. As to claims 5, 38, Yamaguchi et al teaches a display panel associated with a method of correcting luminance, the display panel comprising

As shown in Fig. 1A, consecutive rectangular voltage pulses were used as a driving signal, and the application period of the voltage pulses was divided into three periods (col. 8, lines 37-40). The correction method has several steps, and a voltage to be added to each device in each step is set as follows. Particularly, VLmeasure, a driving voltage for measuring the luminance of each phosphor in a measuring step, Vshift, a characteristics shift voltage for adjusting the luminance of each phosphor to become uniform in an adjusting step, Vdrive, a maximum voltage for driving the devices to display an image. Those voltages have a relation as shown below.

Vdrive < VLmeasure < Vshift

As shown above, since VLmeasure is higher than Vdrive, a higher voltage is added to each surface conduction emission device in advance, than a driving voltage of displaying an image. Therefore, the characteristics of each device are kept from being changed by being added a higher voltage in an actual usage. Further, since Vshift is set to be more higher than VLmeasure, the shift characteristics voltage Vshift is a maximum voltage to be added to each surface conduction emission device. Accordingly, the electron emission characteristics of each device can be corrected to a desired value by adding the Vshift. Furthermore, since Vshift is set to be higher than Vdrive, the characteristics of each device do not change in the actual usage after the luminance of each phosphor has been adjusted to be uniform (col. 15, line 67 to col. 17, line 23).

As to claims 6, 39, Yamaguchi teaches Vdrive<VEmeasure<Vshift (col. 11, lines 3-12).

5. As to claims 7, 40, Yamaguchi teaches a display panel associated with a method of correcting luminance, the display panel comprising

since the light emission luminance of a phosphor can be regarded as proportional to the emission current Ie, the electron-emitting characteristics may be changed in accordance with a variation in measured light emission luminance. More specifically, luminance data measured by the luminance measuring device 13 is converted into a value B corresponding to the emission current Ie or device current If of the emission device by the luminance signal extraction circuit 14, and the value B is output to a control circuit 91 (col. 17, lines 44-52). A variation in luminance including a partial variation in light emission characteristics of the phosphor is corrected (renew operation, col. 17, lines 57-58).

As to claims 8, 39, Yamaguchi teaches the process is repeated from step S6 to S7 to S3 (see fig. 7).

6. As to claims 20, 53, Yamaguchi teaches a display panel associated with a method of correcting luminance, the display panel comprising

since the light emission luminance of a phosphor can be regarded as proportional to the emission current Ie, the electron-emitting characteristics may be changed in accordance with a variation in measured light emission luminance. More specifically, luminance data measured by the luminance measuring device 13 is converted into a value B corresponding to the emission current Ie or device current If of the emission device by the luminance signal extraction circuit 14, and the value B is output to a control circuit 91 (col. 17, lines 44-52). A variation in luminance including a

partial variation in light emission characteristics of the phosphor is corrected (renew operation, col. 17, lines 57-58).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 24-33, 56-66 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguchi et al in view of Howard et al (US 6,023,259).

As to claims 24-33, 56-66, Yamaguchi et al teaches all of the claimed limitations, except for a gray scale realization method for the display panel is pulse width control.

Howard et al teaches a display device comprising gray levels can be generated both pulse width modulation and amplitude modulation (col. 8, lines 1-34).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Yamaguchi's driver circuit including gray levels can be generated both pulse width modulation and amplitude modulation, in view of the teaching in Howard's reference because this would produce a good quality gray scale image, while fabricating a driver at low cost as taught by Howard (col. 5, lines 1-15).

9. Claims 23 and 67 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguchi et al in view of Xie et al (US 6,025,819).

As to claim 23 and 67, Yamaguchi teaches all of the claimed limitations, except for gamma correction.

Xie et al teaches a display panel comprising gamma corrections (fig. 5, col. 4, line 57).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Yamaguchi's driver circuit including gamma corrections, in view of the teaching in the Xie's reference because this would provide an improved method for achieving a gray scale in a field emission display device, which provides a high number of gray scale levels as taught by Xie (col. 2, lines 9-11).

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Kevin M. Nguyen** whose telephone number is **703-305-6209**. The examiner can normally be reached on MON-THU from 9:00-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Richard A Hjerpe** can be reached on **703-305-4709**.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9306 (for Technology Center 2600 only)

Hand-delivered response should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

Kevin M. Nguyen
Patent Examiner
Art Unit 2674

KN
April 30, 2004

XIAO WU
PRIMARY EXAMINER